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NATIONAL VEGETATION CLASSIFICATION SURVEY

At

Plot 3A

Wrexham Industrial Estate
Bryn Lane
Wrexham
LL13 9UT

NGR: SJ 39340 50457

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A handwritten signature in black ink, appearing to read 'Toby Hart', is positioned below the 'Approved by:' line.

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EXECUTIVE SUMMARY

This report is written by Tom Kenwright BSc MSc, Senior Ecologist for United Environmental Services Ltd (UES). UES were commissioned to undertake a National Vegetation Classification (NVC) survey of a parcel of land known as Plot 3A, located off Bryn Lane, Wrexham Industrial Estate, Wrexham. The development proposals are for the construction of three industrial units with associated parking and access roads.

A preliminary ecological appraisal (PEA) including an extended phase 1 habitat undertaken of the site in September 2021 identified numerous fields of semi-improved grassland, one of which could potentially be described as unimproved grassland. Following the recommendation of the PEA, all areas of grassland on site that have any potential to be adversely impacted by the proposed development were subject to an NVC survey on the 4th August 2022.

The NVC system provides a comprehensive classification of natural and semi-natural habitats. Quadrats were used to collect data on the abundance and frequency of each plant species. This information was then analysed using NVC community / sub-community descriptions as each NVC community type is uniquely defined by a particular combination of frequency and abundance values. The survey was carried out to recognised guidelines, timings and weather conditions. Parts of the site were subject to some vegetation clearance works earlier in the year. As such, the NVC survey was postponed until later in the year when sufficient growth was present. At the time of the survey, the grassland swards were considered to be representative of the pre-mowing conditions and the same species and associated abundances were observed as during the PEA walkover survey in September 2021, prior to mowing.

The NVC survey found that the grassland communities on site include the MG1 *Arrhenatherum elatius* community, MG5 *Cynosurus cristatus* - *Centaurea nigra* community, MG9 *Holcus lanatus* - *Dechampsia cespitosa* community and the MG10 *Holcus lanatus* – *Juncus effusus* rush pasture community. The grasslands on site do not contain any protected or otherwise notable or uncommon botanical species, therefore they have been assessed as being low-moderately diverse semi-improved neutral grasslands which would be of local importance only. These grasslands are not considered to meet the criteria for selection as a Wildlife Site. The exception to this is the MG5 grassland that supports some uncommon species and meets the criteria for selection as a Wildlife Site. Additionally, this grassland meets the criteria to qualify as the lowland meadow Habitat of Principal Importance and is considered to be of county importance.

Grasslands 4 and 5 are due to be largely retained as part of the proposals and should be subject to long-term management and enhancement to remove encroaching scrub and to ensure they does not succumb to succession and to maximise their ecological value. Compensation for the loss of Grasslands 1, 2 and 3 and small sections of Grassland 4 and 5 should be provided though additional grassland creation or the enhancement of retained areas of grassland.

This report should be read in conjunction with appendices 1 to 5, which give visual representation of the survey results and full species lists for each grassland community.

1 INTRODUCTION

1.1 Author, surveyors and qualifications

This report is compiled and written by Tom Kenwright BSc MSc, UES Senior Ecologist. Tom holds a level 5 Botanical Society for Britain and Ireland (BSBI) field identification skills certificate (FISC), which certifies him as competent to undertake phase 1 habitat and NVC surveys. Other surveyors present included:

- Toby Hart BSc MCIEEM PIEMA, UES Managing Director. Toby holds a level 6 BSBI FISC, which certifies him as competent to undertake phase 1 habitat and NVC surveys

1.2 Survey objectives

UES was commissioned in 2022 to conduct site surveys which include the following activities:

- Identify any botanical species of international, national and local importance with an emphasis on species native to Wrexham County
- Identify and classify the habitat types and vegetation communities present on site and assess their ecological diversity
- Provide information to assess and mitigate any potential impacts on any habitats of conservation significance which may be present on site

1.3 Proposed development and previous survey information

The development proposals are for the construction of three industrial units with associated parking and access roads.

A PEA including an extended phase 1 habitat undertaken of the site in September 2021 identified numerous fields of semi-improved grassland, one of which could potentially be described as unimproved grassland. The grasslands were found to vary in quality, and some appeared to be relatively diverse, supporting a number of herbs indicative of less agriculturally improved conditions. As such, the recommendations of the PEA report included undertaking NVC surveys of the semi-improved grasslands in order to determine the extent and ecological value of these habitats, to inform the site design and any possible mitigation or compensation.

1.4 Structure of the report

This report sets out the methodology, results, and recommendations in relation to a specific survey. Recommendations are in line with statutory legislation and planning policy objectives.

This report should be read in conjunction with appendices 1 to 5, which give visual representation of the survey results and full species lists for each grassland community.

2 METHODOLOGY

2.1 Field survey

A detailed NVC survey was undertaken on the 4th August 2022 by Tom Kenwright and Toby Hart.

Sampling of the vegetation was undertaken according to the methodology detailed in the NVC Users' Handbook (Rodwell, 2006) and British Plant Communities Volume 3 (Rodwell, 1992). This involved recording the plant species present within a series of 2m x 2m quadrats, which were placed within what were visually considered to be stands of homogenous vegetation. A minimum of five quadrats were recorded in each area where the vegetation was considered to potentially be representative of a distinct vegetation community. All plants recorded within a quadrat were assigned a DOMIN score, based on the percentage cover. The DOMIN scale is as follows:

Table 1 – The DOMIN scale of cover / abundance

COVER PERCENTAGE (%)	DOMIN SCORE
91 - 100	10
76 – 90	9
51 – 75	8
34 – 50	7
26 – 33	6
11 – 25	5
4 – 10	4
<4 (many individuals)	3
<4 (several individuals)	2
<4 (few individuals)	1

Frequencies were then assigned to each species recorded in each surveyed vegetative community based on how many quadrats the species was present within. The frequencies are as follows:

Table 2 – Species frequency classes and descriptions

PRESENCE OF SPECIES IN QUADRATS (%)	FREQUENCY CLASS	DESCRIPTION
1 – 20 (i.e. 1 stand in 5)	I	Scarce
21 - 40	II	Occasional
41 - 60	III	Frequent
61 - 80	IV	Constant
81 - 100	V	Constant

2.2 Analysis of field data

Following the completion of the field work, the plant communities surveyed were then classified according to NVC standards. This analysis was based on the following:

- The largely dichotomous key to vegetative communities within the British Plant Communities Vol. 3.

- Comparison of floristic tables and community descriptions within the British Plant Communities Vol. 3.
- Computer analysis using the Modular Analysis of Vegetation Information System (MAVIS) software package, created by the Centre for Ecology and Hydrology (CEH).
- Surveyor experience.

2.3 Comparison with selection criteria for wildlife sites in Wales

Within Wales, non-statutory designated sites that have biological designation features (opposed to geological features) are referred to as Wildlife Sites. No specific selection criteria are available for Wildlife Sites within Wrexham County and so the grassland communities on site have been compared with the 'Wildlife Sites Guidance Wales, A Guide to Develop Local Wildlife Systems in Wales' (Wales Biodiversity Partnership, 2008).

Neutral grassland features in the selection guidelines for Wildlife Site Guidance Wales and the guidance makes specific reference to the lowland meadow habitat type. The guidance describes lowland meadows as 'those which have developed on soils which are not strongly of either an acidic or basic nature, and are typically of moderate fertility. Key grasses include species such as crested dog's-tail *Cynosurus cristatus*, red fescue *Festuca rubra*, common bent *Agrostis capillaris* and in some cases false oat-grass *Arrhenatherum elatius* and Yorkshire fog *Holcus lanatus*.'

The document also contains a list of species indicative of unimproved neutral grasslands in South Wales, at Appendix 1 Table 3. No list is available for unimproved grassland indicator species in North Wales.

The document suggests that the following should be considered for selection as local wildlife sites:

- All examples of:
 - *Alopecurus pratensis* - *Sanguisorba officinalis* grasslands (MG4)
 - *Cynosurus cristatus* - *Centaurea nigra* grasslands (MG5)
 - *Cynosurus cristatus* - *Caltha palustris* grasslands (MG8)
- All relatively species-rich neutral grasslands (which could include MG1 *Arrhenatherum elatius* community, *Lolium perenne* - *Cynosurus cristatus* community & MG10 *Holcus lanatus* – *Juncus effusus* rush pasture community) of any significant extent.
- examples of neutral grasslands that contain uncommon species, such as whorled caraway *Carum verticillatum* or adder's tongue *Ophioglossum vulgatum*.

2.4 Comparison with Habitats of Principal Importance

The presence of any Habitats of Principal Importance for the conservation of biodiversity as listed within Section 7 of the Environment (Wales) Act 2016 were determined by comparing the surveyed habitats against the published definitions and qualifying criteria (formerly UK Biodiversity Action Plan (BAP) Priority Habitats).

The definition for Lowland Meadow Habitat of Principal Importance doesn't have strict selection criteria based on the presence or absence of specific species and instead states the following:



“A wide-ranging approach is adopted in this plan to lowland grasslands treated as lowland meadows. They are taken to include most forms of unimproved neutral grassland across the enclosed lowland landscapes of the UK. In terms of National Vegetation Classification plant communities, they primarily embrace each type of Cynosurus cristatus-Centaurea nigra grassland (MG5), Alopecurus pratensis-Sanguisorba officinalis floodplain meadow (MG4) and Cynosurus cristatus-Caltha palustris flood-pasture (MG8). The plan is not restricted to grasslands cut for hay, but also takes into account unimproved neutral pastures where livestock grazing is the main land use.”

Grasslands representative of these NVC communities should therefore be considered to qualify as the Lowland Meadow Habitat of Principal Importance.

2.5 Survey limitations

The NVC survey was undertaken on the 4th August 2022 at an appropriate time of year to undertake grassland surveys. In May 2022, some of the grasslands on site were mown. As such, the NVC survey was postponed until later in the year when sufficient growth was present. At the time of the survey, the grassland swards were considered to be representative of the pre-mowing conditions and the same species and associated abundances were observed as during the PEA walkover survey in September 2021, prior to mowing. As such, it is considered that this management intervention is not a significant limitation on the NVC survey or its conclusions.



3 RESULTS

3.1 Grassland 1

The northernmost grassland field on site contains what appears to be one of the lowest quality grasslands. Whilst undertaking the NVC survey it was found that the smaller field to the south-east also contained the same vegetative community and so Quadrats 6 and 7 were sampled from this field, opposed to undertaking five new quadrats as was undertaken for different vegetative communities.

The full species list for this grassland, together with the DOMIN and frequency values is found below in Table 3. Species highlighted in red are listed as indicators of unimproved grassland within the Wales Wildlife Site Selection Guidelines.

Table 3 – Grassland 1 NVC survey quadrat data

Latin name	Common name	DOMIN score							Frequency (%)	Frequency (score)	Frequency (description)
		1	2	3	4	5	6	7			
<i>Alopecurus pratensis</i>	Meadow foxtail	6	6	7	5	7	7	4	100.0	V	Constant
<i>Festuca rubra</i>	Red fescue	2	7	4	6		6		71.4	IV	Constant
<i>Phleum pratense</i>	Timothy	4			6	7	4	5	71.4	IV	Constant
<i>Agrostis stolonifera</i>	Creeping bent			1	1	2	3	5	71.4	IV	Constant
<i>Holcus lanatus</i>	Yorkshire fog	1		2		1			42.9	III	Frequent
<i>Centaurea nigra</i>	Common knapweed		4	6	1				42.9	III	Frequent
<i>Anthoxanthum odoratum</i>	Sweet vernal grass			2	2	4		6	57.1	III	Frequent
<i>Cirsium vulgare</i>	Spear thistle	1		1				3	42.9	III	Frequent
<i>Cerastium fontanum</i>	Common mouse-ear			1		2		3	42.9	III	Frequent
<i>Ranunculus repens</i>	Creeping buttercup			1	4		4		42.9	III	Frequent
<i>Festuca arundinacea</i>	Tall fescue	5	1						28.6	II	Occasional
<i>Potentilla reptans</i>	Creeping cinquefoil	6	4						28.6	II	Occasional
<i>Ranunculus acris</i>	Meadow buttercup	1	1						28.6	II	Occasional
<i>Rumex acetosa</i>	Common sorrel			2	1				28.6	II	Occasional
<i>Taraxacum officinale</i> agg.	Dandelion				1	1			28.6	II	Occasional
<i>Sonchus oleraceus</i>	Smooth sow thistle	1						1	28.6	II	Occasional
<i>Epilobium ciliatum</i>	American willowherb	1						1	28.6	II	Occasional
<i>Agrostis capillaris</i>	Common bent			2				2	28.6	II	Occasional
<i>Rumex conglomeratus</i>	Clustered dock					1	2		28.6	II	Occasional
<i>Cardamine pratensis</i>	Cuckoo flower					1		1	28.6	II	Occasional
<i>Polygonum aviculare</i> agg.	Knotgrass	1							14.3	I	Scarce
<i>Galium aparine</i>	Cleavers	1							14.3	I	Scarce
<i>Cirsium arvense</i>	Creeping thistle		4						14.3	I	Scarce
<i>Lolium perenne</i>	Perennial rye-grass			4					14.3	I	Scarce
<i>Lathyrus pratensis</i>	Meadow vetchling			4					14.3	I	Scarce
<i>Jacobaea erucifolia</i>	Hoary ragwort			3					14.3	I	Scarce
<i>Urtica dioica</i>	Stinging nettle				2				14.3	I	Scarce
<i>Vicia sativa</i>	Common vetch				2				14.3	I	Scarce
<i>Juncus inflexus</i>	Hard rush					3			14.3	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb						1		14.3	I	Scarce
<i>Rumex crispus</i>	Curled dock						2		14.3	I	Scarce
Additional species noted within the grassland but not within the sample quadrats											Abundance (DOMIN)
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	-	-	Occasional
<i>Elymus repens</i>	Common couch	-	-	-	-	-	-	-	-	-	Occasional
<i>Arrhenatherum elatius</i>	False oat-grass	-	-	-	-	-	-	-	-	-	Occasional
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-	-	-	-	-	Occasional
<i>Persicaria maculosa</i>	Redshank	-	-	-	-	-	-	-	-	-	Rare
<i>Lipandra polysperma</i>	Many-seeded goosefoot	-	-	-	-	-	-	-	-	-	Rare
<i>Sonchus asper</i>	Prickly sow thistle	-	-	-	-	-	-	-	-	-	Rare
<i>Poa humilis</i>	Spreading meadow grass	-	-	-	-	-	-	-	-	-	Rare
<i>Anagallis arvensis</i>	Scarlet pimpernel	-	-	-	-	-	-	-	-	-	Rare
<i>Salix cinerea</i>	Grey willow sapling	-	-	-	-	-	-	-	-	-	Rare

The grassland poorly matches any recognised vegetation community, likely due to the historical use of the site for agricultural purposes followed by a period of being unmanaged, coupled with the varied ground conditions e.g. small areas of impeded drainage across the grassland.

When the data is used in conjunction with the published keys for grassland and surveyor experience, it is considered that the grassland most closely matches the MG9 – *Holcus lanatus* - *Deschampsia cespitosa* community, with some areas showing a greater affinity to the the *Poa trivialis* sub-community and others the *Arrhenatherum elatius* sub-community. This is supported by the MAVIS analysis of the quadrat data which showed a moderate correlation with the MG9 community. This conclusion has been reached as whilst missing constant tufted hair-grass, it is occasional across the sward and the grassland contains other



species associated with MG9 and its sub-communities such as Yorkshire fog, sweet vernal grass *Anthoxanthum odoratum* and common knapweed *Centaurea nigra*.

The analysis also considered whether the grassland meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8), nor does it represent one of the communities that should be considered when species rich (MG1, MG6 and MG10). The majority of the sward is dominated by a small number of coarse and competitive grass species. Whilst six unimproved neutral grassland indicator species were recorded within the grassland these are all relatively common and widespread species and of these, only common knapweed was frequent within the grassland, occurring within 3 of the 7 quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

3.2 Grassland 2

The central grassland field on site contains what also appears to be one of the lower quality grasslands. Whilst undertaking the NVC survey, this grassland was found to be the same or a very similar community to Grassland 3 within the adjacent field to the east, however Grassland 3 appeared to have a slightly greater botanical diversity and so they were treated as separate communities for the purpose of the survey and five quadrats were sampled within each grassland.

The full species list for this grassland, together with the DOMIN and frequency values is found below in Table 4. Species highlighted in red are listed as indicators of unimproved grassland within the Wales Wildlife Site Selection Guidelines.



Table 4 – Grassland 2 NVC survey quadrat data

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		8	9	10	11	12			
<i>Agrostis stolonifera</i>	Creeping bent	4	2	4	2	4	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	3	2	4	2	4	100.0	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass		4	4	7	4	80.0	IV	Constant
<i>Ranunculus repens</i>	Creeping buttercup	4	3	5	4		80.0	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4	7	80.0	IV	Constant
<i>Potentilla reptans</i>	Creeping cinquefoil	2		5		5	60.0	III	Frequent
<i>Alopecurus pratensis</i>	Meadow foxtail		8	4	4		60.0	III	Frequent
<i>Ranunculus acris</i>	Meadow buttercup	1		3		4	60.0	III	Frequent
<i>Cirsium arvense</i>	Creeping thistle	7	4		6		60.0	III	Frequent
<i>Rumex acetosa</i>	Common sorrel	2		1		4	60.0	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog	4		2			40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch	2				2	40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	2			2		40.0	II	Occasional
<i>Elymus repens</i>	Common couch	4		5			40.0	II	Occasional
<i>Vicia cracca</i>	Tufted vetch			2		1	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1		2	40.0	II	Occasional
<i>Equisetum arvense</i>	Field horsetail				1	2	40.0	II	Occasional
<i>Cirsium vulgare</i>	Spear thistle	2					20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue				2		20.0	I	Scarce
<i>Centaurea nigra</i>	Common knapweed				3		20.0	I	Scarce
<i>Cerastium fontanum</i>	Common mouse-ear			1			20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent	3					20.0	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb					3	20.0	I	Scarce
<i>Vicia tetrasperma</i>	Smooth tare	4					20.0	I	Scarce
<i>Rubus fruticosus agg.</i>	Bramble	5					20.0	I	Scarce
<i>Quercus robur</i>	Pedunculate oak (sapling)	1					20.0	I	Scarce
<i>Cirsium palustre</i>	Marsh thistle	1					20.0	I	Scarce
<i>Pulicaria dysenterica</i>	Common fleabane				2		20.0	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				2		20.0	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2		20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Filipendula ulmaria</i>	Meadowsweet	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-	-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare

The MAVIS analysis of the quadrat data for this grassland has shown a moderate correlation with the MG9 community. However, when the data is used in conjunction with the published keys for grassland and surveyor experience, it is considered that the community present most accurately represents the MG1 *Arrhenatherum elatius* community. This is due to the presence of constant false oat-grass which forms one of the most abundant species within the sward, in addition to many other species associated with this community, such as creeping bent *Agrostis stolonifera*, creeping thistle *Cirsium arvense* and common knapweed.

The analysis also considered whether the grassland meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to at least partially represent the MG1 community, it is not considered to be a species-rich example of this community. The majority of the sward is dominated by a small number of coarse and competitive grass species. Only three unimproved neutral grassland indicator species were recorded within the grassland, all of which are relatively common and widespread species and of these, only hoary ragwort *Jacobaea erucifolia* was constant within the grassland, the other two only being recorded in one of the five quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.



3.3 Grassland 3

Grassland 3 appears to be one of the higher quality grasslands on site. Whilst undertaking the NVC survey, this grassland was found to be the same or a very similar community to Grassland 2 within the adjacent field to the west, however Grassland 3 appeared to have a greater botanical diversity and so they were treated as separate communities for the purpose of the survey and five quadrats were sampled within each grassland.

The full species list for this grassland, together with the DOMIN and frequency values is found below in Table 5. Species highlighted in red are listed as indicators of unimproved grassland within the Wales Wildlife Site Selection Guidelines.

Table 5 – Grassland 3 NVC survey quadrat data

Latin name	Common name	DOMIN score							Frequency (%)	Frequency (score)	Frequency (description)
		13	14	15	16	17	18	19			
<i>Ranunculus acris</i>	Meadow buttercup	4	4	5	2	6	3	1	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	2	3	3	1	4	2		85.7	V	Constant
<i>Centaurea nigra</i>	Common knapweed	5		4	2	1	4	2	85.7	V	Constant
<i>Rumex acetosa</i>	Common sorrel	2	4	2	1		2	1	85.7	V	Constant
<i>Ranunculus repens</i>	Creeping buttercup	2	4	5	3		4	3	85.7	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	5		5	6	7	3	5	85.7	V	Constant
<i>Agrostis stolonifera</i>	Creeping bent		6	4	3	5	3	2	85.7	V	Constant
<i>Rumex crispus</i>	Curled dock		1	2	2	2		1	71.4	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4		5	4	71.4	IV	Constant
<i>Alopecurus pratensis</i>	Meadow foxtail		4	5	6		5	6	71.4	IV	Constant
<i>Festuca rubra</i>	Red fescue	4			4			4	42.9	III	Frequent
<i>Potentilla reptans</i>	Creeping cinquefoil		5		4		2		42.9	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle			3		4		1	42.9	III	Frequent
<i>Vicia tetrasperma</i>	Smooth tare	3			1			1	42.9	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog			2	4		3	2	57.1	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	4						1	28.6	II	Occasional
<i>Pulicaria dysenterica</i>	Common fleabane	1					1		28.6	II	Occasional
<i>Quercus robur</i>	Pedunculate oak (sapling)	1							14.3	I	Scarce
<i>Festuca arundinacea</i>	Tall fescue			4					14.3	I	Scarce
<i>Galium palustre</i>	Marsh bedstraw			1					14.3	I	Scarce
<i>Angelica sylvestris</i>	Wild angelica				2				14.3	I	Scarce
<i>Juncus conglomeratus</i>	Compact rush				2				14.3	I	Scarce
<i>Elymus repens</i>	Common couch				1				14.3	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb				1				14.3	I	Scarce
<i>Phleum pratense</i>	Timothy				5				14.3	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				1				14.3	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2				14.3	I	Scarce
Additional species noted within the grassland but not within the sample quadrats											Abundance (DOMIN)
<i>Aegopodium podagraria</i>	Ground elder	-	-	-	-	-	-	-	-	-	Rare
<i>Vicia hirsuta</i>	Hairy tare	-	-	-	-	-	-	-	-	-	Rare
<i>Filipendula ulmaria</i>	Meadowseet	-	-	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	-	-	Rare
<i>Stellaria graminea</i>	Lesser stitchwort	-	-	-	-	-	-	-	-	-	Rare
<i>Geranium dissectum</i>	Cut-leaved crane's-bill	-	-	-	-	-	-	-	-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-	-	-	-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-	-	-	-	-	Rare
<i>Equisetum arvense</i>	Field horsetail	-	-	-	-	-	-	-	-	-	Rare

The MAVIS analysis of the quadrat data for this grassland has shown a moderate correlation with the MG9 community. However, when the data is used in conjunction with the published keys for grassland and surveyor experience, it is considered that the community present most accurately represents the MG1 community. This is due to the presence of constant false oat-grass which forms one of the most abundant species within the sward, in addition to many other species associated with this community, such as creeping bent, Yorkshire fog and red fescue.

The analysis also considered whether the grassland meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to represent the MG1 community, it is not considered to be a species-rich example of this community. The majority of the sward is dominated by a small number of coarse and competitive grass species. Whilst six unimproved neutral grassland indicator species were recorded within the grassland, all of which are relatively common and widespread species and of these, only hoary ragwort and common knapweed were constant within the



grassland, the others only being recorded in one of the five quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

3.4 Grassland 4

During the initial PEA survey, this grassland was identified as potentially qualifying as unimproved grassland and determining its value was the key focus of this NVC survey. However, the entire field within which this community lies is not homogenous and the field slopes downwards to the north-east, resulting in impeded drainage and the presence of a different grassland community (Grassland 5), as described below Section 3.5. In addition, some areas are being encroached by tall ruderal species and bramble scrub. The southern and westernmost sections of this grassland are the most species-rich and so these areas were the focus of the quadrat sampling.

The full species list for this grassland, together with the DOMIN and frequency values is found below in Table 6. Species highlighted in red are listed as indicators of unimproved grassland within the Wales Wildlife Site Selection Guidelines.

Table 6 – Grassland 4 NVC survey quadrat data

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		20	21	22	23	24			
<i>Centaurea nigra</i>	Common knapweed	7	7	5	7	5	100.0	V	Constant
<i>Galium verum</i>	Ladies bedstraw	7	7	7	5	5	100.0	V	Constant
<i>Lotus corniculatus</i>	Common bird's-foot trefoil	4	4	5	4	5	100.0	V	Constant
<i>Holcus lanatus</i>	Yorkshire fog	1	2	4	4	4	100.0	V	Constant
<i>Cirsium arvense</i>	Creeping thistle		1	2		1	60.0	III	Frequent
<i>Plantago lanceolata</i>	Ribwort plantain	3	3			4	60.0	III	Frequent
<i>Medicago lupulina</i>	Black medick	3	2		5		60.0	III	Frequent
<i>Festuca rubra</i>	Red fescue		1	4		4	60.0	III	Frequent
<i>Briza media</i>	Quaking grass			2	5	5	60.0	III	Frequent
<i>Anthoxanthum odoratum</i>	Sweet vernal grass			4	4	4	60.0	III	Frequent
<i>Jacobaea erucifolia</i>	Hoary ragwort	2		1		2	60.0	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	2			1	1	60.0	III	Frequent
<i>Leucanthemum vulgare</i>	Oxeye daisy	2	4				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock			2		1	40.0	II	Occasional
<i>Trifolium repens</i>	White clover			2	3		40.0	II	Occasional
<i>Prunella vulgaris</i>	Self heal			1	1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup			2	1		40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch			2	2		40.0	II	Occasional
<i>Cynosurus cristatus</i>	Crested dog's-tail				4	1	40.0	II	Occasional
<i>Potentilla reptans</i>	Creeping cinquefoil				2		20.0	I	Scarce
<i>Jacobaea vulgaris</i>	Common ragwort				1		20.0	I	Scarce
<i>Rubus fruticosus</i> agg.	Bramble					2	20.0	I	Scarce
<i>Vicia cracca</i>	Tufted vetch					1	20.0	I	Scarce
<i>Dactylis glomerata</i>	Cock's-foot					1	20.0	I	Scarce
<i>Rosa</i> sp.	Rose					1	20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent					1	20.0	I	Scarce
<i>Geranium pusillum</i>	Small-flowered crane's-bill	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	2					20.0	I	Scarce
<i>Primula vulgaris</i>	Primrose	2					20.0	I	Scarce
<i>Achillea millefolium</i>	Yarrow	4					20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Ophrys apifera</i>	Bee orchid	-	-	-	-	-	-	-	Rare
<i>Lathyrus nissolia</i>	Grass vetchling	-	-	-	-	-	-	-	Rare
<i>Dactylorhiza fuchsii</i>	Common spotted orchid	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Heracleum sphondylium</i>	Common hogweed	-	-	-	-	-	-	-	Rare
<i>Cirsium vulgare</i>	Spear thistle	-	-	-	-	-	-	-	Rare

The MAVIS analysis of the quadrat data for this grassland has shown a low correlation with the MG1, MG5 and MG9 communities. However, when the data is used in conjunction with

the published keys for grassland and the surveyor experience, it is considered that the community present most accurately represents the MG5 community.

This conclusion has been reached due to the high cover from herbaceous species and a lack of grass cover associated with this community. Additionally, the grassland supports a number of constants of this community such as common knapweed, ladies bedstraw *Galium verum*, common bird's-foot trefoil *Lotus corniculatus*, crested dog's-tail, red fescue, Yorkshire fog and ribwort plantain *Plantago lanceolata*. The grassland is considered to most closely represent the *Galium verum* sub-community due to the abundance of ladies bedstraw within the sward, however the majority of other species characteristic of this community aren't present e.g. sheep's-fescue *Festuca ovina*, yellow oat-grass *Trisetum flavescens* and downy oat-grass *Avenula pubescens*.

The analysis also considered whether the grassland meets the selection criteria for Local Wildlife Sites within Wales. The grassland represents a good example of the NVC community MG5 that is recommended for selection. Eleven unimproved neutral grassland indicator species were recorded within the grassland, six of which were constant or frequent within the grassland. The majority of the species present are common and widespread, however quaking grass *Briza media* and grass vetchling *Lathyrus nissolia* are uncommon species that are generally restricted to higher value grasslands. Therefore, it is considered that the grassland does meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland represents the community MG5, it is considered to meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

3.5 Grassland 5

Grassland 5 comprises a distinctly different vegetative community compared to the other areas of grassland on site, largely due to the abundance of rushes. During the initial PEA survey, this grassland was mapped as marshy grassland.

The full species list for this grassland, together with the DOMIN and frequency values is found below in Table 7. Species highlighted in red are listed as indicators of unimproved grassland within the Wales Wildlife Site Selection Guidelines.

Table 7 – Grassland 5 NVC survey quadrat data

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		25	26	27	28	29			
<i>Pulicaria dysenterica</i>	Common fleabane	7	9	9	8	9	100.0	V	Constant
<i>Juncus inflexus</i>	Hard rush	6	4	4	7	5	100.0	V	Constant
<i>Epilobium hirsutum</i>	Great willowherb	4	3	1	1	4	100.0	V	Constant
<i>Carex otrubae</i>	False fox sedge	4		2		4	60.0	III	Frequent
<i>Vicia cracca</i>	Tufted vetch	1		3		2	60.0	III	Frequent
<i>Rumex conglomeratus</i>	Clustered dock	3	4	1			60.0	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle	1			1	1	60.0	III	Frequent
<i>Agrostis stolonifera</i>	Creeping bent		1	1		2	60.0	III	Frequent
<i>Urtica dioica</i>	Stinging nettle	1			1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup	2	1				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	3	1				40.0	II	Occasional
<i>Juncus effusus</i>	Soft rush		2			2	40.0	II	Occasional
<i>Rubus fruticosus</i> agg.	Bramble			4		3	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1	2		40.0	II	Occasional
<i>Carex flacca</i>	Glaucous sedge				3	2	40.0	II	Occasional
<i>Centaurea nigra</i>	Common knapweed				1	1	40.0	II	Occasional
<i>Jacobaea erucifolia</i>	Hoary ragwort				2	1	40.0	II	Occasional
<i>Lathyrus pratensis</i>	Meadow vetchling				1	2	40.0	II	Occasional
<i>Juncus conglomeratus</i>	Compact rush	2					20.0	I	Scarce
<i>Helminthotheca echioides</i>	Bristly oxtongue	1					20.0	I	Scarce
<i>Solanum dulcamara</i>	Bittersweet	1					20.0	I	Scarce
<i>Epilobium tetragonum</i>	Square-stalked willowherb	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	1					20.0	I	Scarce
<i>Prunella vulgaris</i>	Self heal	1					20.0	I	Scarce
<i>Cirsium arvense</i>	Creeping thistle	4					20.0	I	Scarce
<i>Holcus lanatus</i>	Yorkshire fog		1				20.0	I	Scarce
<i>Anagallis arvensis</i>	Scarlet pimpernel				1		20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue					3	20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare

The MAVIS analysis of the quadrat data for this grassland didn't show a strong affinity to any community. However, when the data is used in conjunction with the published keys for grassland and the surveyor's experience, it is considered that the community present most accurately represents the MG10 *Holcus lanatus* – *Juncus effusus* rush pasture community, specifically the *Juncus inflexus* sub-community.

This conclusion has been reached due to the abundance of rush cover and the low abundance and diversity of grasses. The grassland supports many of the constant species associated with this community including creeping bent, Yorkshire fog, creeping buttercup *Ranunculus repens*, curled dock *Rumex crispus* and clustered dock *Rumex conglomeratus*. The grassland is considered to represent the *Juncus inflexus* sub-community due to the low abundance of soft rush *Juncus effusus* and a greater cover of hard rush *Juncus inflexus*.

The analysis also considered whether the grassland meets the selection criteria for Local Wildlife Sites within Wales. The grassland doesn't represent any of the NVC communities that are recommended for selection (MG4, MG5 and MG8). Whilst it is considered to represent the MG10 community, it is not considered to be a particularly species-rich example of this community as the sward is dominated by hard rush and common fleabane *Pulicaria dysenterica*. Whilst six unimproved neutral grassland indicator species were recorded within the grassland, only tufted vetch *Vicia cracca* was frequent within the grassland, the others being occasional or rare and only occurring within 1 or two of the quadrats. Therefore, the grassland does not meet the qualifying criteria for selection as a Local Wildlife Site within Wales.

As the grassland is relatively species poor and does not represent the communities MG4, MG5 or MG8, it does not meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

4 EVALUATION AND RECOMMENDATIONS

4.1 Evaluation of results

The detailed botanical survey of Grasslands 1, 2, 3 and 5 has shown that these areas are not of sufficient botanical interest to be considered as the lowland meadow Habitat of Principal Importance and they do not meet the current selection criteria for Wildlife Sites in Wales. These communities have undergone a degree of agricultural improvement in the past and as such are not unimproved grasslands. These grasslands do not contain any protected or otherwise notable or uncommon botanical species, therefore these areas of grassland have been assessed as containing low-moderately diverse semi-improved neutral grassland which would be of local importance only.

The detailed botanical survey of Grassland 4 has shown that this community is representative of the lowland meadow Habitat of Principal Importance and meets the current selection criteria for Wildlife Sites in Wales. This grassland is considered to qualify as unimproved grassland. This grassland does not contain any protected botanical species, however the presence of the uncommon species grass vetchling and quaking grass is notable. The grassland is currently not in a favourable condition and is being encroached by tall ruderal species and bramble scrub. Therefore, this area of grassland is considered to be of county importance.

4.2 Recommendations

Although grasslands 1, 2, 3 and 5 do not meet the criteria to qualify as a Wildlife Site or lowland meadow Habitat of Principal Importance, they are of some local value. Therefore, it is recommended that the development should compensate for the loss of these grasslands, which can be achieved through the enhancement or creation of additional areas of grassland as part of a landscaping scheme.

Grassland 4 comprises unimproved grassland and meets the criteria for the lowland meadow Habitat of Principal Importance and to qualify for selection as a Wildlife Site. As such, this grassland should be retained and protected as part of the development.

The current layout plan for the site shows the loss of Grasslands 1, 2 and 3, and the retention of the majority of Grasslands 4 and 5. The development of the site provides a means for securing long-term retention and management of Grassland 4 which is currently in an unfavourable condition due to a lack of management and encroaching tall ruderal and scrub species. This will provide a significant enhancement as a lack of management, or unsympathetic management, are two of the most important factors that threaten species-rich grassland and result in this being one of the most vulnerable habitats of nature conservation importance in the UK.

Compensation for the loss of the Grasslands 1, 2 and 3 and small sections of Grassland 4 and 5 on site could be achieved through the long-term retention and management of the majority of Grassland 4 and the enhancement of the agricultural and relatively species poor agricultural grassland within the compensation area within the eastern section of the site.

It is considered that the most appropriate form of management of the retained areas of grassland would be a traditional hay cut, however full details of the management of the retained and enhanced areas of grassland on site can be detailed within a Landscape and Ecology Management Plan (LEMP) which can be secured through a planning condition.



5 CONCLUSION

An NVC survey was carried out of the grassland habitats with the potential to be adversely impacted by the proposed development of a parcel of land known as Plot 3A, located off Bryn Lane, Wrexham industrial Estate, Wrexham.

Parts of the site were subject to some vegetation clearance works earlier in the year. As such, the NVC survey was postponed until later in the year when sufficient growth was present. At the time of the survey, the grassland swards were considered to be representative of the pre-mowing conditions and the same species and associated abundances were observed as during the PEA walkover survey in September 2021, prior to mowing.

The NVC survey found that the grasslands on site comprise the MG1, MG5, MG9 and MG10 communities. The majority of these grasslands do not contain any protected or otherwise notable or uncommon botanical species, therefore these areas of grassland have been assessed as being low-moderately diverse semi-improved neutral grasslands which would be of value at a local level only. These grasslands are not considered to meet the criteria for selection as a Wildlife Site or to qualify as the lowland meadow Habitat of Principal Importance. The exception to this is Grassland 5 which supports some uncommon species and meets the criteria for selection as a Wildlife Site. Additionally, this grassland meets the criteria to qualify as the lowland meadow Habitat of Principal Importance and is considered to be of county importance.

The majority of Grasslands 4 and 5 are due to be retained as part of the proposals and should be subject to enhancement to remove encroaching scrub and long-term management to ensure they do not succumb to succession and to maximise their ecological value. Compensation for the loss of Grasslands 1, 2 and 3 and small sections of Grasslands 4 and 5 should be provided through additional grassland creation and the enhancement of retained areas of grassland, particularly Grassland 4 which is currently in unfavourable condition.



6 REFERENCES

Rodwell, J.S. (2006). *NVC Users' Handbook*. JNCC.

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Wales Biodiversity Partnership (2008). *'Wildlife Sites Guidance Wales, A Guide to Develop Local Wildlife Systems in Wales'*



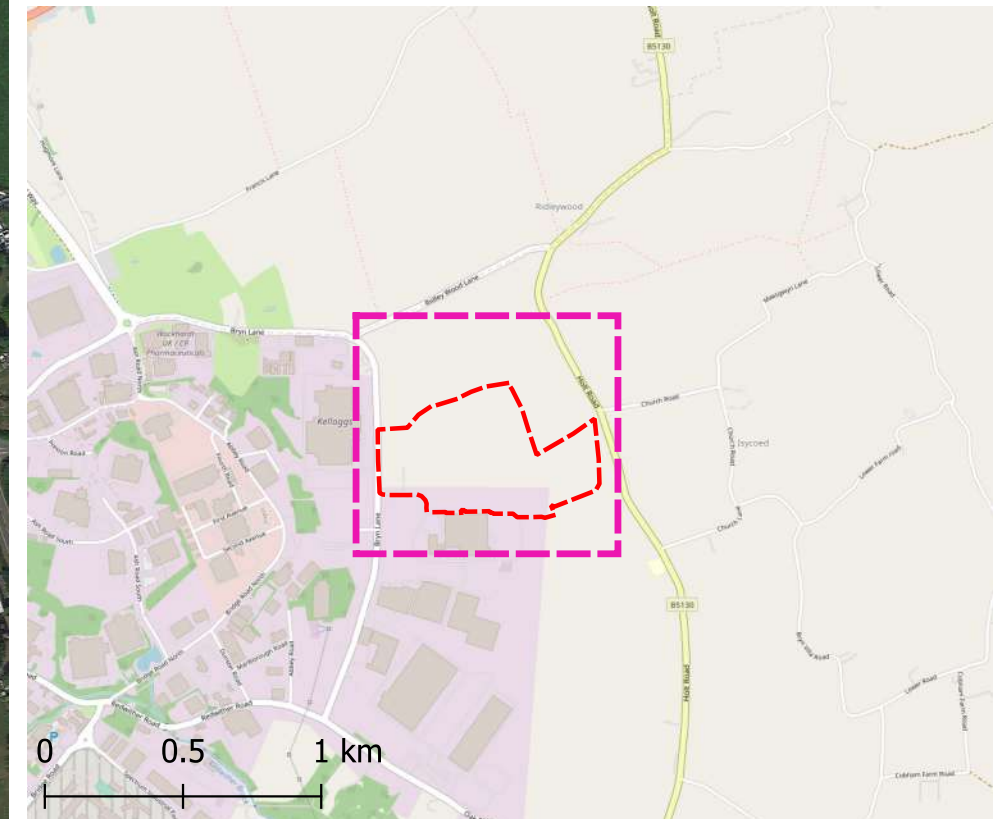
APPENDICES

Appendix 1 – Quadrat locations plan



NVC Survey

**Site: Plot 3a, Wrexham
Industrial Estate
NGR: SJ 39340 50457
Author: Tom Kenwright
Date: 04/08/2022**



KEY:

- NVC quadrats
- Site boundary

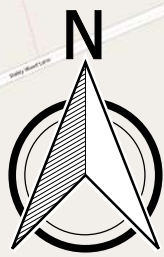
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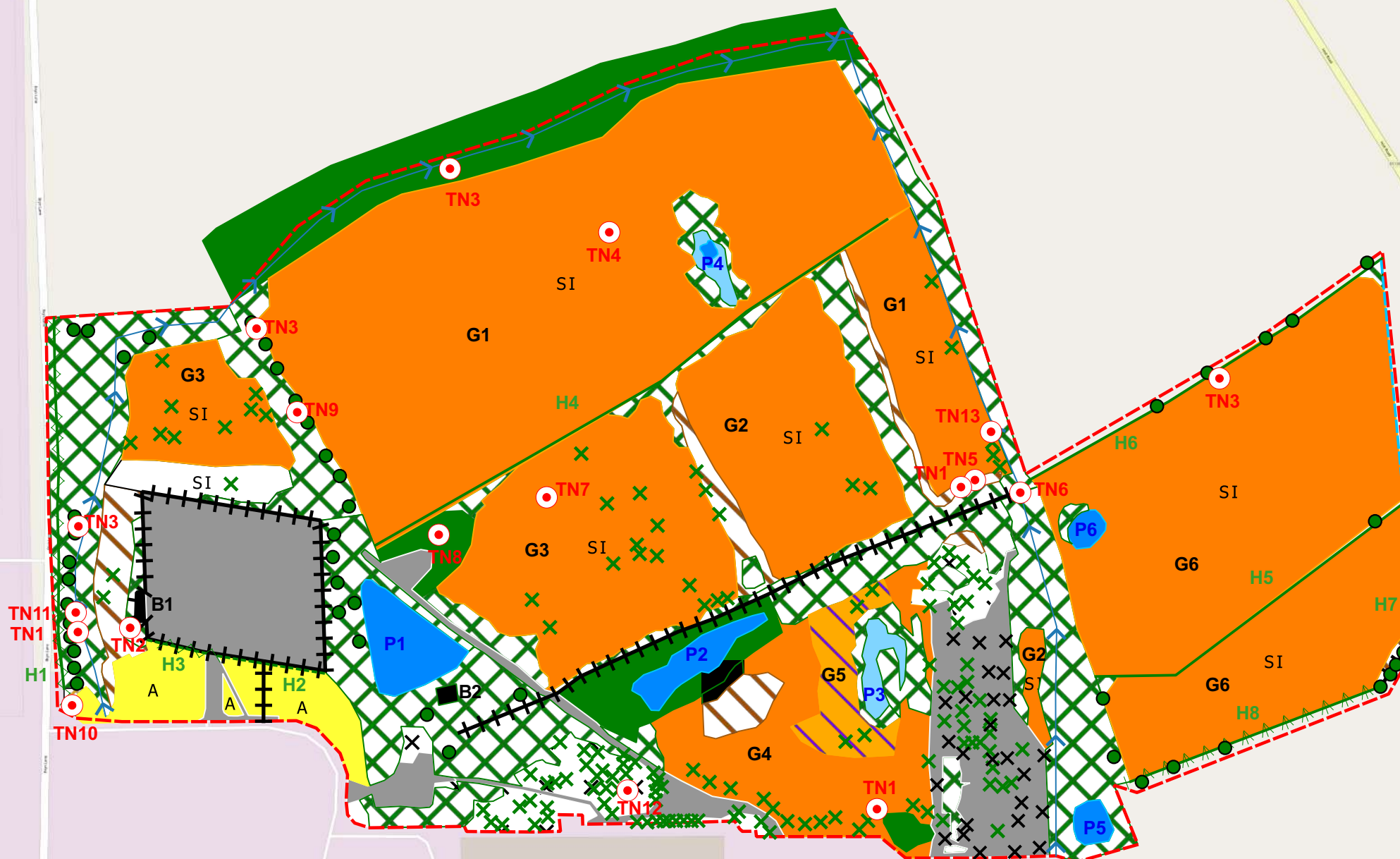
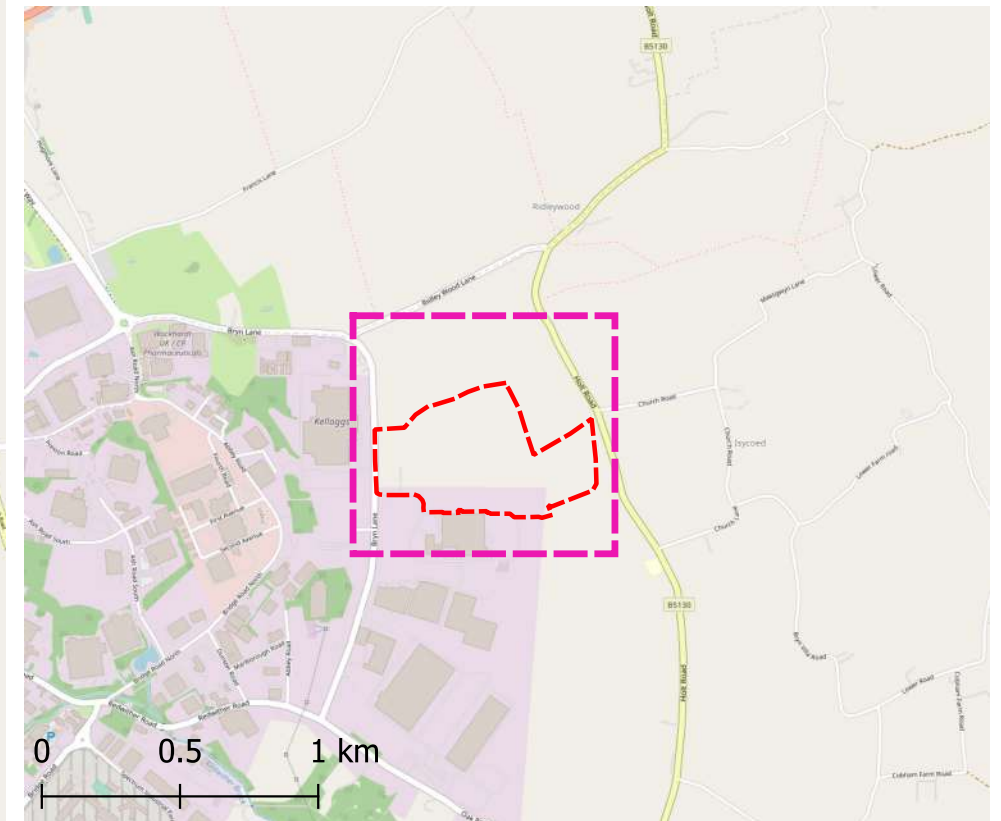


Appendix 2 – Updated Phase 1 habitat plan



Preliminary Ecological Appraisal

Site: Plot 3a, Wrexham Industrial Estate
NGR: SJ 39340 50457
Author: Tom Kenwright
Date: 27/09/2022



KEY:

A1.1.1 - Broadleaved woodland - semi-natural	J1.4 - Introduced shrub
A2.1 - Scrub - dense/continuous	J2.1.1 - Intact hedge - native species-rich
A2.2 - Scrub - scattered	J2.1.2 - Intact hedge - species-poor
A3.1 - Broadleaved scattered trees	J2.2.1 - Defunct hedge - native species-rich
B2.2 - Semi-improved neutral grassland	J2.2.2 - Defunct hedge - species-poor
B5 - Marshy grassland	J2.3.1 - Hedge with trees - native species-rich
B6 - Poor semi-improved grassland	J2.4 - Fence
C3.1 - Tall ruderal	J2.6 - Dry ditch
F1 - Swamp	J3.6 - Buildings
G1 - Standing water	J5 - Hardstanding
G2 - Running water	Survey boundary
J1.2 - Amenity grassland	Target Notes
J1.3 - Ephemeral/short perennial	

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Appendix 3 – Aerial photographs



Plot 3a – Wrexham Industrial Estate

Close aerial photograph

— Survey boundary





Plot 3a – Wrexham Industrial Estate

Wide aerial photograph

 Site location





Appendix 4 – Photographs



Photograph 1 – Looking East across the northernmost field of Grassland 1.



Photograph 2 – Looking north across the smaller field of Grassland 1.



Photograph 3 – Looking north-west across Grassland 2.



Photograph 4 – Looking west across the larger area of Grassland 3.



Photograph 5 – Looking west across Grassland 4.



Photograph 6– Looking north across the ecotone between Grassland 4 and Grassland 5.



Photograph 7 – Example of large area of encroaching tall ruderal vegetation within Grassland 4.



Photograph 8 – Looking north across Grassland 5.



Appendix 5 – Survey results

Grassland 1

[illegible]

Grassland 2

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		8	9	10	11	12			
<i>Agrostis stolonifera</i>	Creeping bent	4	2	4	2	4	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	3	2	4	2	4	100.0	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass		4	4	7	4	80.0	IV	Constant
<i>Ranunculus repens</i>	Creeping buttercup	4	3	5	4		80.0	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4	7	80.0	IV	Constant
<i>Potentilla reptans</i>	Creeping cinquefoil	2		5		5	60.0	III	Frequent
<i>Alopecurus pratensis</i>	Meadow foxtail		8	4	4		60.0	III	Frequent
<i>Ranunculus acris</i>	Meadow buttercup	1		3		4	60.0	III	Frequent
<i>Cirsium arvense</i>	Creeping thistle	7	4		6		60.0	III	Frequent
<i>Rumex acetosa</i>	Common sorrel	2		1		4	60.0	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog	4		2			40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch	2				2	40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	2			2		40.0	II	Occasional
<i>Elymus repens</i>	Common couch	4		5			40.0	II	Occasional
<i>Vicia cracca</i>	Tufted vetch			2		1	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1		2	40.0	II	Occasional
<i>Equisetum arvense</i>	Field horsetail				1	2	40.0	II	Occasional
<i>Cirsium vulgare</i>	Spear thistle	2					20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue				2		20.0	I	Scarce
<i>Centaurea nigra</i>	Common knapweed				3		20.0	I	Scarce
<i>Cerastium fontanum</i>	Common mouse-ear			1			20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent	3					20.0	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb					3	20.0	I	Scarce
<i>Vicia tetrasperma</i>	Smooth tare	4					20.0	I	Scarce
<i>Rubus fruticosus</i> agg.	Bramble	5					20.0	I	Scarce
<i>Quercus robur</i>	Pedunculate oak (sapling)	1					20.0	I	Scarce
<i>Cirsium palustre</i>	Marsh thislte	1					20.0	I	Scarce
<i>Pulicaria dysenterica</i>	Common fleabane				2		20.0	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				2		20.0	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2		20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Filipendula ulmaria</i>	Meadowsweet	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-	-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare

Grassland 3

Latin name	Common name	DOMIN score							Frequency (%)	Frequency (score)	Frequency (description)
		13	14	15	16	17	18	19			
<i>Ranunculus acris</i>	Meadow buttercup	4	4	5	2	6	3	1	100.0	V	Constant
<i>Jacobaea erucifolia</i>	Hoary ragwort	2	3	3	1	4	2		85.7	V	Constant
<i>Centaurea nigra</i>	Common knapweed	5		4	2	1	4	2	85.7	V	Constant
<i>Rumex acetosa</i>	Common sorrel	2	4	2	1		2	1	85.7	V	Constant
<i>Ranunculus repens</i>	Creeping buttercup	2	4	5	3		4	3	85.7	V	Constant
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	5		5	6	7	3	5	85.7	V	Constant
<i>Agrostis stolonifera</i>	Creeping bent		6	4	3	5	3	2	85.7	V	Constant
<i>Rumex crispus</i>	Curled dock		1	2	2	2		1	71.4	IV	Constant
<i>Arrhenatherum elatius</i>	False oat-grass	5	4		4		5	4	71.4	IV	Constant
<i>Alopecurus pratensis</i>	Meadow foxtail		4	5	6		5	6	71.4	IV	Constant
<i>Festuca rubra</i>	Red fescue	4			4			4	42.9	III	Frequent
<i>Potentilla reptans</i>	Creeping cinquefoil		5		4		2		42.9	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle			3		4		1	42.9	III	Frequent
<i>Vicia tetrasperma</i>	Smooth tare	3			1			1	42.9	III	Frequent
<i>Holcus lanatus</i>	Yorkshire fog			2	4		3	2	57.1	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	4						1	28.6	II	Occasional
<i>Pulicaria dysenterica</i>	Common fleabane	1					1		28.6	II	Occasional
<i>Quercus robur</i>	Pedunculate oak (sapling)	1							14.3	I	Scarce
<i>Festuca arundinacea</i>	Tall fescue			4					14.3	I	Scarce
<i>Galium palustre</i>	Marsh bedstraw			1					14.3	I	Scarce
<i>Angelica sylvestris</i>	Wild angelica				2				14.3	I	Scarce
<i>Juncus conglomeratus</i>	Compact rush				2				14.3	I	Scarce
<i>Elymus repens</i>	Common couch				1				14.3	I	Scarce
<i>Epilobium hirsutum</i>	Great willowherb				1				14.3	I	Scarce
<i>Phleum pratense</i>	Timothy				5				14.3	I	Scarce
<i>Dactylorhiza fuchsii</i>	Common spotted orchid				1				14.3	I	Scarce
<i>Poa trivialis</i>	Rough meadow-grass				2				14.3	I	Scarce
Additional species noted within the grassland but not within the sample quadrats											Abundance (DOMIN)
<i>Aegopodium podagraria</i>	Ground elder	-	-	-	-	-			-	-	Rare
<i>Vicia hirsuta</i>	Hairy tare	-	-	-	-	-			-	-	Rare
<i>Filipendula ulmaria</i>	Meadowseet	-	-	-	-	-			-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-			-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-			-	-	Rare
<i>Stellaria graminea</i>	Lesser stitchwort	-	-	-	-	-			-	-	Rare
<i>Geranium dissectum</i>	Cut-leaved crane's-bill	-	-	-	-	-			-	-	Rare
<i>Juncus effusus</i>	Soft rush	-	-	-	-	-			-	-	Rare
<i>Juncus inflexus</i>	Hard rush	-	-	-	-	-			-	-	Rare
<i>Equisetum arvense</i>	Field horsetail	-	-	-	-	-			-	-	Rare

Grassland 4

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		20	21	22	23	24			
<i>Centaurea nigra</i>	Common knapweed	7	7	5	7	5	100.0	V	Constant
<i>Galium verum</i>	Ladies bedstraw	7	7	7	5	5	100.0	V	Constant
<i>Lotus corniculatus</i>	Common bird's-foot trefoil	4	4	5	4	5	100.0	V	Constant
<i>Holcus lanatus</i>	Yorkshire fog	1	2	4	4	4	100.0	V	Constant
<i>Cirsium arvense</i>	Creeping thistle		1	2		1	60.0	III	Frequent
<i>Plantago lanceolata</i>	Ribwort plantain	3	3			4	60.0	III	Frequent
<i>Medicago lupulina</i>	Black medick	3	2		5		60.0	III	Frequent
<i>Festuca rubra</i>	Red fescue		1	4		4	60.0	III	Frequent
<i>Briza media</i>	Quaking grass			2	5	5	60.0	III	Frequent
<i>Anthoxanthum odoratum</i>	Sweet vernal grass			4	4	4	60.0	III	Frequent
<i>Jacobaea erucifolia</i>	Hoary ragwort	2		1		2	60.0	III	Frequent
<i>Lathyrus pratensis</i>	Meadow vetchling	2			1	1	60.0	III	Frequent
<i>Leucanthemum vulgare</i>	Oxeye daisy	2	4				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock			2		1	40.0	II	Occasional
<i>Trifolium repens</i>	White clover			2	3		40.0	II	Occasional
<i>Prunella vulgaris</i>	Self heal			1	1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup			2	1		40.0	II	Occasional
<i>Vicia sativa</i>	Common vetch			2	2		40.0	II	Occasional
<i>Cynosurus cristatus</i>	Crested dog's-tail				4	1	40.0	II	Occasional
<i>Potentilla reptans</i>	Creeping cinquefoil				2		20.0	I	Scarce
<i>Jacobaea vulgaris</i>	Common ragwort				1		20.0	I	Scarce
<i>Rubus fruticosus</i> agg.	Bramble					2	20.0	I	Scarce
<i>Vicia cracca</i>	Tufted vetch					1	20.0	I	Scarce
<i>Dactylis glomerata</i>	Cock's-foot					1	20.0	I	Scarce
<i>Rosa</i> sp.	Rose					1	20.0	I	Scarce
<i>Agrostis capillaris</i>	Common bent					1	20.0	I	Scarce
<i>Geranium pusillum</i>	Small-flowered crane's-bill	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	2					20.0	I	Scarce
<i>Primula vulgaris</i>	Primrose	2					20.0	I	Scarce
<i>Achillea millefolium</i>	Yarrow	4					20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Ophrys apifera</i>	Bee orchid	-	-	-	-	-	-	-	Rare
<i>Lathyrus nissolia</i>	Grass vetchling	-	-	-	-	-	-	-	Rare
<i>Dactylorhiza fuchsii</i>	Common spotted orchid	-	-	-	-	-	-	-	Rare
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare
<i>Urtica dioica</i>	Stinging nettle	-	-	-	-	-	-	-	Rare
<i>Rumex obtusifolius</i>	Broadleaved dock	-	-	-	-	-	-	-	Rare
<i>Heracleum sphondylium</i>	Common hogweed	-	-	-	-	-	-	-	Rare
<i>Cirsium vulgare</i>	Spear thistle	-	-	-	-	-	-	-	Rare

Grassland 5

Latin name	Common name	DOMIN score					Frequency (%)	Frequency (score)	Frequency (description)
		25	26	27	28	29			
<i>Pulicaria dysenterica</i>	Common fleabane	7	9	9	8	9	100.0	V	Constant
<i>Juncus inflexus</i>	Hard rush	6	4	4	7	5	100.0	V	Constant
<i>Epilobium hirsutum</i>	Great willowherb	4	3	1	1	4	100.0	V	Constant
<i>Carex otrubae</i>	False fox sedge	4		2		4	60.0	III	Frequent
<i>Vicia cracca</i>	Tufted vetch	1		3		2	60.0	III	Frequent
<i>Rumex conglomeratus</i>	Clustered dock	3	4	1			60.0	III	Frequent
<i>Cirsium palustre</i>	Marsh thistle	1			1	1	60.0	III	Frequent
<i>Agrostis stolonifera</i>	Creeping bent		1	1		2	60.0	III	Frequent
<i>Urtica dioica</i>	Stinging nettle	1			1		40.0	II	Occasional
<i>Ranunculus repens</i>	Creeping buttercup	2	1				40.0	II	Occasional
<i>Rumex crispus</i>	Curled dock	3	1				40.0	II	Occasional
<i>Juncus effusus</i>	Soft rush		2			2	40.0	II	Occasional
<i>Rubus fruticosus</i> agg.	Bramble			4		3	40.0	II	Occasional
<i>Heracleum sphondylium</i>	Common hogweed			1	2		40.0	II	Occasional
<i>Carex flacca</i>	Glaucous sedge				3	2	40.0	II	Occasional
<i>Centaurea nigra</i>	Common knapweed				1	1	40.0	II	Occasional
<i>Jacobaea erucifolia</i>	Hoary ragwort				2	1	40.0	II	Occasional
<i>Lathyrus pratensis</i>	Meadow vetchling				1	2	40.0	II	Occasional
<i>Juncus conglomeratus</i>	Compact rush	2					20.0	I	Scarce
<i>Helminthotheca echioides</i>	Bristly oxtongue	1					20.0	I	Scarce
<i>Solanum dulcamara</i>	Bittersweet	1					20.0	I	Scarce
<i>Epilobium tetragonum</i>	Square-stalked willowherb	1					20.0	I	Scarce
<i>Hypericum hirsutum</i>	Hairy St John's-wort	1					20.0	I	Scarce
<i>Prunella vulgaris</i>	Self heal	1					20.0	I	Scarce
<i>Cirsium arvense</i>	Creeping thistle	4					20.0	I	Scarce
<i>Holcus lanatus</i>	Yorkshire fog		1				20.0	I	Scarce
<i>Anagallis arvensis</i>	Scarlet pimpernel				1		20.0	I	Scarce
<i>Festuca rubra</i>	Red fescue					3	20.0	I	Scarce
Additional species noted within the grassland but not within the sample quadrats									Abundance (DOMIN)
<i>Deschampsia cespitosa</i>	Tufted hair-grass	-	-	-	-	-	-	-	Rare
<i>Potentilla anserina</i>	Silverweed	-	-	-	-	-	-	-	Rare